



**Barcelona
Supercomputing
Center**
Centro Nacional de Supercomputación



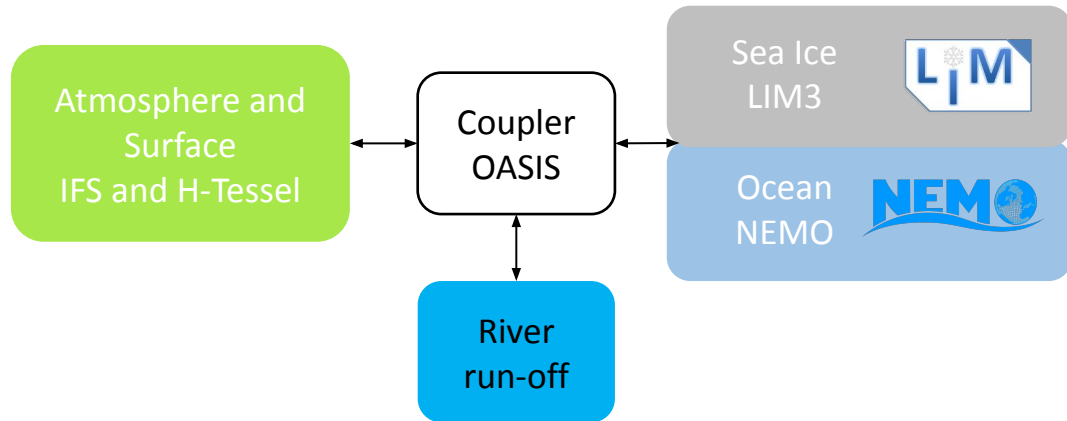
Seasonal forecast system at High-Resolution using a tuned version of EC-Earth3

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EC-Earth3 High-resolution configuration



Model Components

IFS (Atmospheric Model):

T511 ~39km
L91 (top 0.01hPa) ~mesosphere
IFS-HTESSEL (Land Model)

NEMO (Ocean Model):

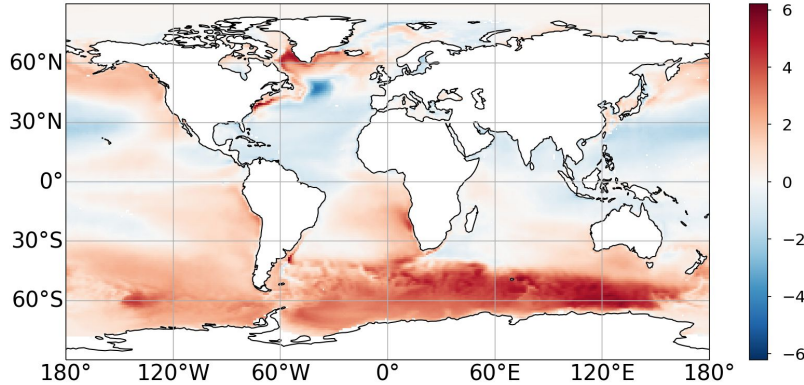
Nominal 0.25° resolution
L75 levels (thousands km deep)

LIM (Sea-ice Model):

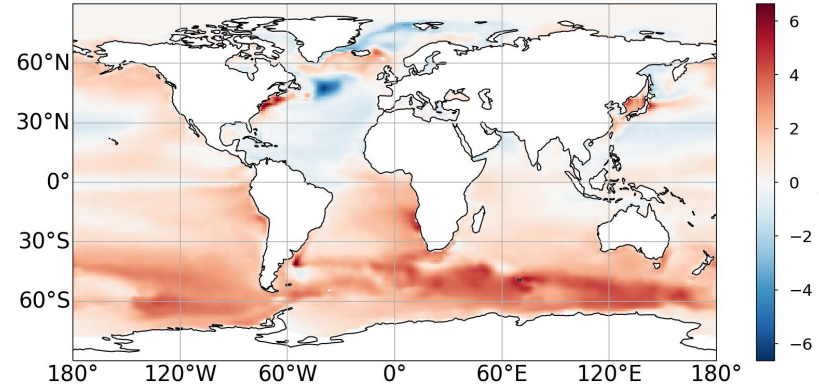
Multiple (5) ice category

1) Tuning of EC-Earth3-HR

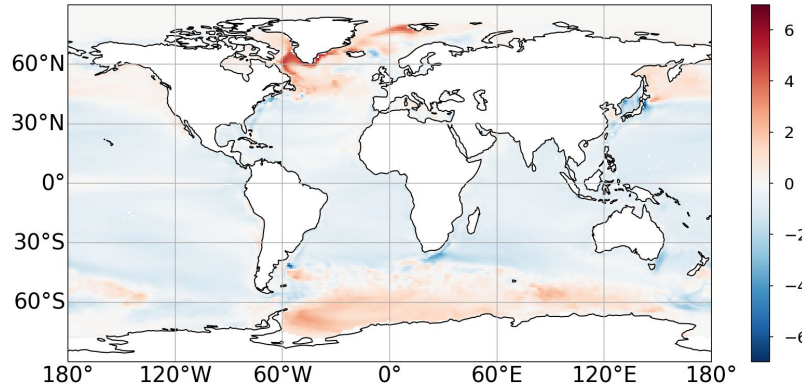
HR - OBS



SR - OBS



HR - SR



OBS: Hadisst (1980-1999)
EXP: last 70 years

- HR slightly colder than SR
- No collapse of Labrador Sea Convection as in EC-Earth3-SR

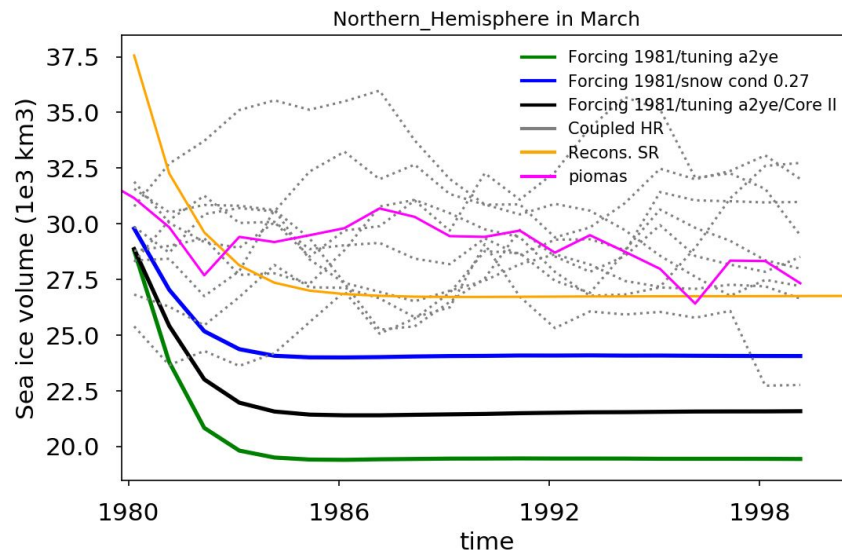
2) Initial Conditions of the forecast systems

Atmospheric + Land Reanalysis
ERA5

Ocean Reconstruction

- ERA5 surface fluxes
- ORAS5 nudging at the surface
- EN4 nudging in the subsurface

Impact of the snow conductivity value on
Nemo-only experiments



HR forecast systems: 3) Seasonal and 4) Decadal

3) Seasonal Hincasts

Hindcast period: 1990-2015

Ensemble: 25 members

Forecast range:

15 memb. from May to August
(4 forecasted months)

10 memb. from May to December
(8 forecasted months)

4) Reduced DCPD system

Normal

1960-2020
(every yr)

10 members

10 forecast yrs

TOTAL (6100 yrs)

Reduced

1960-2020
(every 2nd yr)

5 members

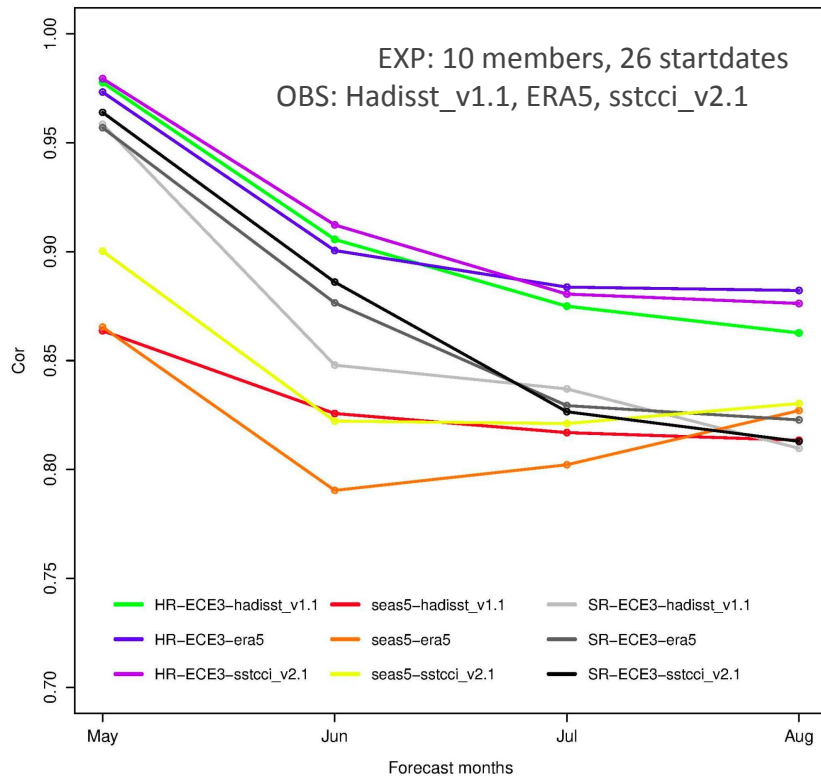
3 forecast yrs

TOTAL (465 yrs)

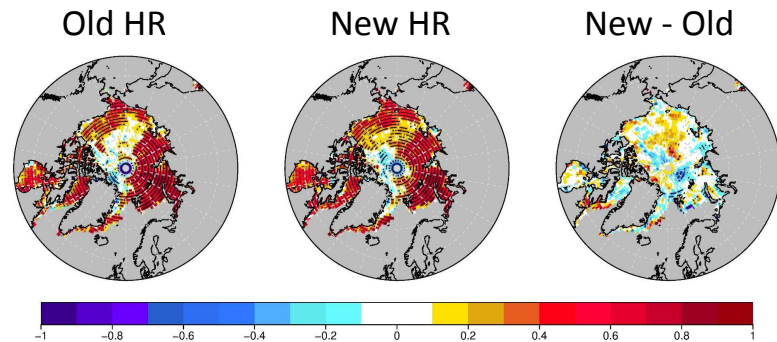
Hindcasts to be run soon

3) Seasonal forecast - Preliminary results

Anomaly correlation coefficients (ACC)
for the Nino3.4 SST



Comparison with previous non-tuned
HR version



ACC maps for JJA Sea Ice Concentration

EXP: 10 members, 17 startdates
OBS: Cersat